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( sensor<in>ab ) <and> ( interface program<in>ab )

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**1 A simple low cost data acquisition system for remote sensing of rel humidity and temperature**

*Moghavvemi, M.; Faruque, M.O.; Ng Koon Eng; Soo Choon Yip;*  
Circuits and Systems, 2001. MWSCAS 2001. Proceedings of the 44th IEEE 2001 Midwest Symposium on , Volume: 1 , 14-17 Aug. 2001  
Pages:202 - 206 vol.1

[\[Abstract\]](#) [\[PDF Full-Text \(324 KB\)\]](#) **IEEE CNF**

**2 A high performance, multi-application single card signal processor**

*Hopp, D.M.; Habereder, H.;*  
Aerospace and Electronics Conference, 1990. NAECON 1990., Proceedings of t IEEE 1990 National , 21-25 May 1990  
Pages:83 - 89 vol.1

[\[Abstract\]](#) [\[PDF Full-Text \(536 KB\)\]](#) **IEEE CNF**

**3 INSITE/sup (R/) continuous monitoring system-information not da**

*Harpham, S.W.; Woodward, R.C.;*  
Monitors and Condition Assessment Equipment (Digest No. 1996/186), IEE Colloquium on , 5 Dec. 1996  
Pages:5/1 - 5/8

[\[Abstract\]](#) [\[PDF Full-Text \(356 KB\)\]](#) **IEE CNF**



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**1 [Proceedings of the 1st ACM international workshop on Wireless sensor networks and applications](#)**

C. S. Raghavendra, Krishna M. Sivalingam  
September 2002 proceeding, ACM Press

Additional Information: [full citation](#), [abstract](#)

It is with great pleasure that we welcome you to attend the First ACM International Workshop on Wireless Sensor Networks and Applications (WSNA 2002), held in Atlanta, on September 28, 2002. WSNA 2002, sponsored by ACM SIGMOBILE, is held in conjunction with ACM MobiCom 2002 conference. This workshop is a forum to discuss the latest findings in wireless sensors, communication protocols, and applications of wireless sensor networks. There has been tremendous technological advances in the development ...

**2 [Maté: a tiny virtual machine for sensor networks](#)**

Philip Levis, David Culler

October 2002 **Proceedings of the 10th international conference on Architectural support for programming languages and operating systems**, Volume 37 , 30 , 36 Issue 10 , 5 , 5

Full text available: [pdf\(1.22 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Composed of tens of thousands of tiny devices with very limited resources ("motes"), sensor networks are subject to novel systems problems and constraints. The large number of motes in a sensor network means that there will often be some failing nodes; networks must be easy to repopulate. Often there is no feasible method to recharge motes, so energy is a precious resource. Once deployed, a network must be reprogrammable although physically unreachable, and this reprogramming can be a significant ...

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**2** [Smart kindergarten: sensor-based wireless networks for smart developmental problem-solving environments](#)

Mani Srivastava, Richard Muntz, Miodrag Potkonjak  
July 2001 **Proceedings of the 7th annual international conference on Mobile computing and networking**

Full text available: [pdf\(292.84 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Despite enormous progress in networking and computing technologies, their application has remained restricted to conventional person-to-person and person-to-computer communication. However, continual reduction in cost and form factor is now making it possible to imbed networking - even wireless networking - and computing capabilities not just in our PCs and laptops but also other objects. Further, a marriage of these ever tinier and cheaper processors and wireless network interfaces with emer ...

**3** [Exposure in wireless sensor networks: theory and practical solutions](#)

Seapahn Megerian, Farinaz Koushanfar, Gang Qu, Giacomo Veltri, Miodrag Potkonjak  
September 2002 **Wireless Networks**, Volume 8 Issue 5

Full text available: [pdf\(294.60 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Wireless ad hoc sensor networks have the potential to provide the missing interface between the physical world and the Internet, thus impacting a large number of users. This connection will enable computational treatments of the physical world in ways never before possible. In this far reaching scenario, Quality of Service can be expressed in terms of accuracy and/or latency of observing events and the overall state of the physical world.

Consequently, one of the fundamental problems in sensor n ...

**Keywords:** coverage, exposure, network, sensor, wireless

**4 New models and architectures: An ultra low-power processor for sensor networks**

Virantha Ekanayake, Clinton Kelly, Rajit Manohar

October 2004 **Proceedings of the 11th international conference on Architectural support for programming languages and operating systems**

Full text available:  pdf(437.23 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a novel processor architecture designed specifically for use in low-power wireless sensor-network nodes. Our sensor network asynchronous processor (SNAP/LE) is based on an asynchronous data-driven 16-bit RISC core with an extremely low-power idle state, and a wakeup response latency on the order of tens of nanoseconds. The processor instruction set is optimized for sensor-network applications, with support for event scheduling, pseudo-random number generation, bitfield operations, and ...

**Keywords:** asynchronous, event-driven, low-energy, picojoule computing, sensor network processor, sensor networks, wireless

**5 Routing and MAC: Versatile low power media access for wireless sensor networks**

Joseph Polastre, Jason Hill, David Culler

November 2004 **Proceedings of the 2nd international conference on Embedded networked sensor systems**

Full text available:  pdf(529.51 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We propose *B-MAC*, a carrier sense media access protocol for wireless sensor networks that provides a flexible interface to obtain ultra low power operation, effective collision avoidance, and high channel utilization. To achieve low power operation, *B-MAC* employs an adaptive preamble sampling scheme to reduce duty cycle and minimize idle listening. *B-MAC* supports on-the-fly reconfiguration and provides bidirectional interfaces for system services t ...

**Keywords:** communication interfaces, energy efficient operation, media access protocols, networking, reconfigurable protocols, wireless sensor networks

**6 Systems: The networked sensor tapestry (NeST): a privacy enhanced software architecture for interactive analysis of data in video-sensor networks**

Douglas A. Fidaleo, Hoang-Anh Nguyen, Mohan Trivedi

October 2004 **Proceedings of the ACM 2nd international workshop on Video surveillance & sensor networks**

Full text available:  pdf(674.07 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper details the architecture of a test-bed under development for secure sharing, capture, distributed processing, and archiving of surveillance data called the Networked Sensor Tapestry (NeST). The test-bed consists of core software modules including a centralized server, client interface library, a layered XML messaging scheme. Mobile hardware clients are interfaced to the NeST using a Tiny-OS based microcontroller with sensor data collected over a 1-wire data bus. Maintaining subject ...

**Keywords:** privacy, surveillance architecture, video-sensor networks

**7 Impala: a middleware system for managing autonomic, parallel sensor systems**

Ting Liu, Margaret Martonosi

June 2003 **ACM SIGPLAN Notices , Proceedings of the ninth ACM SIGPLAN symposium on Principles and practice of parallel programming**, Volume 38 Issue 10

Full text available:  [pdf\(684.33 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Sensor networks are long-running computer systems with many sensing/compute nodes working to gather information about their environment, process and fuse that information, and in some cases, actuate control mechanisms in response. Like traditional parallel systems, communication between nodes is of fundamental importance, but is typically accomplished via wireless transceivers. One further key attribute of sensor networks is that they are almost always long running systems, intended to operate i ...

**Keywords:** middleware system, sensor networks, software adaptation, software update

**8 Demo abstracts: Intel Mote: using bluetooth in sensor networks**

Ralph Kling, Robert Adler, Jonathan Huang, Vincent Hummel, Lama Nachman

November 2004 **Proceedings of the 2nd international conference on Embedded networked sensor systems**

Full text available:  [pdf\(204.63 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

The Intel Mote is a new sensor node platform motivated by several design goals: increased CPU performance, improved radio bandwidth and reliability and the usage of commercial off-the-shelf components in order to maintain cost-effectiveness. This new platform is built around an integrated wireless microcontroller consisting of an ARM\*7 core, a Bluetooth\* radio, RAM and FLASH memory as well as various I/O options. Due to the connection-oriented nature of Bluetooth, a new network formation and ...

**9 Research challenges in wireless networks of biomedical sensors**

Loren Schwiebert, Sandeep K.S. Gupta, Jennifer Weinmann

July 2001 **Proceedings of the 7th annual international conference on Mobile computing and networking**

Full text available:  [pdf\(612.60 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Implanted biomedical devices have the potential to revolutionize medicine. *Smart sensors*, which are created by combining sensing materials with integrated circuitry, are being considered for several biomedical applications such as a glucose level monitor or a retina prosthesis. These devices require the capability to communicate with an external computer system (base station) via a wireless interface. The limited power and computational capabilities of smart sensor based biological imp ...

**10 Maté: a tiny virtual machine for sensor networks**

Philip Levis, David Culler

October 2002 **Proceedings of the 10th international conference on Architectural support for programming languages and operating systems**, Volume 37 , 30 , 36 Issue 10 , 5 , 5

Full text available:  [pdf\(1.22 MB\)](#)

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**11 Wide-area monitoring of mobile objects: Implementing software on resource-**

**constrained mobile sensors: experiences with Impala and ZebraNet**

Ting Liu, Christopher M. Sadler, Pei Zhang, Margaret Martonosi

June 2004 **Proceedings of the 2nd international conference on Mobile systems, applications, and services**

Full text available:  [pdf\(3.14 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

ZebraNet is a mobile, wireless sensor network in which nodes move throughout an environment working to gather and process information about their surroundings[10]. As in many sensor or wireless systems, nodes have critical resource constraints such as processing speed, memory size, and energy supply; they also face special hardware issues such as sensing device sample time, data storage/access restrictions, and wireless transceiver capabilities. This paper discusses and evaluates ZebraNet's syst ...

**Keywords:** event handling, middleware system, network communications, operation scheduling, sensor networks

**12 Smart CAPs for Smart Its – Context Detection for Mobile Users**

Florian Michahelles, Michael Samulowitz

January 2002 **Personal and Ubiquitous Computing**, Volume 6 Issue 4

Full text available:  [pdf\(139.30 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Context detection for mobile users plays a major role for enabling novel, human-centric interfaces. For this, we introduce a context detection scheme applicable in a self-organized sensor network, which is formed of disseminated, computer empowered sensors, referred to as *Smart-Its* [1]. Context-detection takes place without requiring any central point of control, and supports push as well as pull modes. Our solution is based on an in-network composition approach relying on so-called *sm* ...

**Keywords:** Context awareness, Perceptual computing, Sensor networks, Smart infrastructure

**13 Ubiquitous computing/security: Towards a new paradigm for securing wireless sensor networks**

K. Jones, A. Wadaa, S. Olariu, L. Wilson, M. Eltoweissy

August 2003 **Proceedings of the 2003 workshop on New security paradigms**

Full text available:  [pdf\(718.31 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

The network model assumed in this paper consists of tiny, energy-constrained, commodity sensors massively deployed alongside with one or more sink nodes that provide the interface to the outside world. The sensors in the network are initially anonymous and unaware of their location. Our main contribution is to propose a new robust and energy-efficient solution for secure operation of wireless sensor networks. The paper motivates a new paradigm where security is based upon using parameterized fre ...

**Keywords:** energy-efficient protocols, frequency hopping, security, wireless sensor networks

**14 Special session on NOMADS: An architectural framework and a middleware for cooperating smart components**

António Casimiro, Jörg Kaiser, Paulo Veríssimo

April 2004 **Proceedings of the first conference on computing frontiers on Computing frontiers**

Full text available:  [pdf\(311.61 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In a future networked physical world, a myriad of smart sensors and actuators assess and control aspects of their environments and autonomously act in response to it. Examples range in telematics, traffic management, team robotics or home automation to name a few. To a large extent, such systems operate proactively and independently of direct human control driven by the perception of the environment and the ability to organize respective computations dynamically. The challenging characteristics ...

**Keywords:** component-based systems, event-based communication, middleware architectures, sentient computing

**15 Papers from Hotnets-II: Exposing resource tradeoffs in region-based communication abstractions for sensor networks**

Matt Welsh

January 2004 **ACM SIGCOMM Computer Communication Review**, Volume 34 Issue 1

Full text available:  [pdf\(139.25 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We argue that communication abstractions for wireless sensor networks should expose the tradeoff between accuracy and resource usage, allowing applications to adapt to changing network conditions and tune energy and bandwidth requirements. We describe *abstract regions*, a family of spatial operators that capture local communication with regions of the network, which may be defined in terms of radio connectivity, geographic location, or other properties of nodes. Abstract regions provide fe ...

**16 Wireless and mobility: Habitat monitoring: application driver for wireless communications technology**

Alberto Cerpa, Jeremy Elson, Deborah Estrin, Lewis Girod, Michael Hamilton, Jerry Zhao

April 2001 **ACM SIGCOMM Computer Communication Review**, Volume 31 Issue 2 supplement

Full text available:  [pdf\(2.46 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

As new fabrication and integration technologies reduce the cost and size of micro-sensors and wireless interfaces, it becomes feasible to deploy densely distributed wireless networks of sensors and actuators. These systems promise to revolutionize biological, earth, and environmental monitoring applications, providing data at granularities unrealizable by other means. In addition to the challenges of miniaturization, new system architectures and new network algorithms must be developed to transf ...

**Keywords:** applications, low-power wireless, sensor networks, testbeds

**17 Habitat monitoring: application driver for wireless communications technology**

Alberto Cerpa, Jeremy Elson, Michael Hamilton, Jerry Zhao, Deborah Estrin, Lewis Girod

April 2001 **Workshop on Data communication in Latin America and the Caribbean**

Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

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**Keywords:** applications, low-power wireless, sensor networks, testbeds

**18 A word from the editor**

Newton Lee

October 2004 **Computers in Entertainment (CIE)**, Volume 2 Issue 4Full text available:  [pdf\(67.56 KB\)](#) Additional Information: [full citation](#), [abstract](#)

Welcome to the first anniversary issue of the ACM Computers in Entertainment! It has been a year since the magazine was launched in October 2003.

In this anniversary issue we publish eight interesting papers on entertainment technologies, including games, audio media, user interface, live HD media streaming, and digital cinema. Two of them were selected from the best papers at the ACM SIGCHI 2004 International Conference on Advances in Computer Entertainment Technology. Four ...

**19** [Centaurus: an infrastructure for service management in ubiquitous computing environments](#)

Lalana Kagal, Vladimir Korolev, Sasikanth Avancha, Anupam Joshi, Tim Finin, Yelena Yesha  
November 2002 **Wireless Networks**, Volume 8 Issue 6

Full text available:  [pdf\(553.67 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In the near future, we will see dramatic changes in computing and networking hardware. A large number of devices (e.g., phones, PDAs, even small household appliances) will become computationally enabled. Micro/nano sensors will be widely embedded in most engineered artifacts, from the clothes we wear to the roads we drive on. All of these devices will be (wirelessly) networked using Bluetooth, IEEE 802.15 or IEEE 802.11 for short range connectivity creating pervasive environments. In this age wh ...

**Keywords:** mobile computing, pervasive computing, service management, ubiquitous computing

**20** [Scoping in wireless sensor networks: a position paper](#)

Jan Steffan, Ludger Fiege, Mariano Cilia, Alejandro Buchmann  
October 2004 **Proceedings of the 2nd workshop on Middleware for pervasive and ad-hoc computing**

Full text available:  [pdf\(291.99 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

One of the trends of wireless sensor networks (WSN) is to allow multiple applications to run on top of the same sensor network. This will have an enormous impact on the way WSN applications are developed, deployed and maintained. Many applications for WSN are still developed on very low level functions provided by simple operating systems or bare hardware. Alternatively, generic WSN middleware focuses on very high-level system abstractions, such as declarative query languages, and acts as bla ...

**Keywords:** multi purpose wireless sensor networks, scopes

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